

Claims

[c1] What is claimed is:

1. A storage capacitor having a scattering effect adapted for use in a thin film transistor array loop, the storage capacitor comprising:

a first electrode positioned in a substrate, the first electrode comprising a first conductive layer;

a rough layer positioned above the first electrode, the rough layer comprising a medium layer and a passivation layer; and

a second electrode, positioned above the rough layer, for implementing the scattering effect toward an external light source.

[c2] 2. The storage capacitor of claim 1 wherein the passivation layer is positioned above the medium layer.

[c3] 3. The storage capacitor of claim 1 wherein the medium layer is positioned above the passivation layer.

[c4] 4. The storage capacitor of claim 1 wherein the second electrode comprises a reflective layer with high reflectivity and conductivity.

- [c5] 5. The storage capacitor of claim 1 wherein the second electrode comprises a second conductive layer and a reflective layer with high reflectivity.
- [c6] 6. The storage capacitor of claim 5 wherein the reflective layer is positioned above the second conductive layer.
- [c7] 7. The storage capacitor of claim 5 wherein the second conductive layer is light-penetrating and positioned above the reflective layer.
- [c8] 8. The storage capacitor of claim 1 wherein the medium layer is composed of materials selected from a group consisting of indium oxide, tin oxide, zinc oxide, lead oxide, indium tin oxide, and indium zinc oxide.
- [c9] 9. The storage capacitor of claim 1 wherein the passivation layer is composed of materials selected from a group consisting of silicon nitride, silicon oxide, and silicon oxynitride.
- [c10] 10. A method of forming a storage capacitor having a scattering effect for use in a thin film transistor array loop, the method comprising the following steps:
forming a first conductive layer and a medium layer on a substrate so as to form an island-like overlapped structure comprising a first electrode, wherein the first conductive layer forms the first electrode;

depositing a passivation layer to overlay the island-like overlapped structure, wherein the medium layer and the passivation layer form a rough layer; and forming a second electrode on the rough layer.

- [c11] 11. The method of claim 10 wherein the second electrode comprises a reflective layer with high reflectivity and conductivity.
- [c12] 12. The method of claim 10 wherein the second electrode is an island-like overlapped structure comprising a second conductive layer and a reflective layer with high reflectivity, and the second conductive layer and the reflective layer are formed consecutively.
- [c13] 13. The method of claim 10 wherein the second electrode is an island-like overlapped structure comprising a reflective layer with high reflectivity and a second conductive layer, the reflective layer and the second conductive layer are formed consecutively, and the second conductive layer is light-penetrating.
- [c14] 14. The method of claim 10 wherein the medium layer is composed of materials selected from a group consisting of indium oxide, tin oxide, zinc oxide, lead oxide, indium tin oxide, and indium zinc oxide.
- [c15] 15. The method of claim 10 wherein the passivation

layer is composed of materials selected from a group consisting of silicon nitride, silicon oxide, and silicon oxynitride.

- [c16] 16. A method of forming a storage capacitor having a scattering effect for use in a thin film transistor array loop, the method comprising the following steps:
forming a first conductive layer on a substrate so as to form a first electrode;
depositing a passivation layer to overlay the first electrode; and
forming an island-like overlapped structure comprising a second electrode on the passivation layer.
- [c17] 17. The method of claim 16 wherein the island-like overlapped structure comprises a medium layer and a reflective layer with high reflectivity formed consecutively, wherein the passivation layer and the medium layer form a rough layer, and the reflective layer forms the second electrode.
- [c18] 18. The method of claim 16 wherein the island-like overlapped structure comprises a medium layer, a second conductive layer, and a reflective layer with high reflectivity formed consecutively, wherein the passivation layer and the medium layer form a rough layer, and the second conductive layer and the reflective layer form the

second electrode.

[c19] 19. The method of claim 17 wherein the medium layer is composed of materials selected from a group consisting of indium oxide, tin oxide, zinc oxide, lead oxide, indium tin oxide, and indium zinc oxide.

[c20] 20. The method of claim 18 wherein the medium layer is composed of materials selected from a group consisting of indium oxide, tin oxide, zinc oxide, lead oxide, indium tin oxide, and indium zinc oxide.

[c21] 21. The method of claim 16 wherein the passivation layer is composed of materials selected from a group consisting of silicon nitride, silicon oxide, and silicon oxynitride.

[c22] 22. A storage capacitor having a scattering effect adapted for use in a thin film transistor array loop, the storage capacitor comprising:
a first electrode, positioned in a substrate, comprising a first conductive layer;
a dielectric layer positioned above the first electrode, the dielectric layer being insulating;
a second electrode, positioned above the dielectric layer, comprising a second conductive layer, a rough layer, and a reflective layer with high reflectivity, the rough layer

being positioned above the second conductive layer and comprising a medium layer and a passivation layer, the passivation layer being positioned above the medium layer, the reflective layer being positioned above the rough layer.

- [c23] 23. The storage capacitor of claim 22 wherein the medium layer is composed of materials selected from a group consisting of indium oxide, tin oxide, zinc oxide, lead oxide, indium tin oxide, and indium zinc oxide.
- [c24] 24. The storage capacitor of claim 22 wherein the passivation layer is composed of materials selected from a group consisting of silicon nitride, silicon oxide, and silicon oxynitride.
- [c25] 25. A storage capacitor having a scattering effect adapted for use in a thin film transistor array loop, the storage capacitor comprising:
a first electrode, positioned in a substrate, comprising a rough layer and a first conductive layer, the rough layer comprising a medium layer and a passivation layer, the medium layer being positioned above the passivation layer, the first conductive layer being positioned above the rough layer;
a dielectric layer positioned above the first electrode, the dielectric layer being insulating; and

a second electrode positioned above the dielectric layer for implementing the scattering effect toward an external light source.

- [c26] 26. The storage capacitor of claim 25 wherein the medium layer is composed of materials selected from a group consisting of indium oxide, tin oxide, zinc oxide, lead oxide, indium tin oxide, and indium zinc oxide.
- [c27] 27. The storage capacitor of claim 25 wherein the passivation layer is composed of materials selected from a group consisting of silicon nitride, silicon oxide, and silicon oxynitride.
- [c28] 28. The storage capacitor of claim 25 wherein the second electrode comprises a reflective layer with high reflectivity.
- [c29] 29. The storage capacitor of claim 25 wherein the second electrode comprises a second conductive layer and a reflective layer with high reflectivity, the reflective layer being positioned above the second conductive layer.